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TITLE : ION-EXCHANGED CARBON NANOTUBE, ITS PRODUCTION, BUFFERING MEDIUM
COMPRISING THE SAME AND ELEMENT CAPTURING AND COLLECTING METHOD
USING THE SAME

ABSTRACT : PURPOSE: To verify and enhance the functionality of carbon nanotubes by providing the nanotubes with a buffering function capable of freely controlling the pH of a liquid over the range from an acidic value to an alkaline value, a function as an ion exchange medium, that is effected by substituting protons in the surfaces of the nanotubes with various other cations, and further, a function of capturing, collecting and recovering rare elements such as uranium(U).

CONSTITUTION: In this production of the carbon nanotubes, protons (H^+) of carboxyl groups ($-COOH$) used as surface functional groups of carbon nanotubes are substituted with other cations by utilizing ion exchange reaction. At this time, e.g. by substituting the protons with strongly basic Na^+ ions, alkaline nanotubes can be produced, and also, by combining the alkaline nanotubes with unsubstituted acidic nanotubes, the resultant combination can be utilized as a medium provided with a buffering function. Further, the nanotubes can also be utilized as a medium for capturing, collecting and recovering a rare element(s) such as uranium(U) by fixing cations contg. the rare element(s) on the nanotubes.

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